WASHINGTON LETTER.

WASHINGTON, SEPTEMBER 29, 1896.

It is just fifty years since the Board of Regents of the Smithsonian Institution held its first meeting. To what extent has geographical investigation been stimulated by the Institution in that period? A broad view of the question would include consideration of cognate subjects, such as ethnology, anthropology, archæology, geology, magnetism, meteorology; but for the present purpose the term "geography" will be considered in the usual or popular understanding of the word.

James Smithson, an Englishman who died in 1829, bequeathed a large property (over $700,000) to the United States "to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men."

The Institution is not therefore local or even national, but for the benefit of mankind, the United States being merely trustee. The two objects—to increase and diffuse—make no restriction in favor of any country, or kind of knowledge.

The Board of Regents determined that "knowledge can be increased by different methods of facilitating and promoting the discovery of new truths, and can be most efficiently diffused among men by means of the press."

The Act of Congress establishing the Institution required also that there should be a library, a museum, and a gallery of art, with a building on a liberal scale to contain them.

To "increase knowledge," the plan of organization proposed to stimulate men of talent to make original researches, by offering suitable rewards; and to "diffuse knowledge," it proposed to publish a series of reports, and occasionally separate treatises. These purposes have been consistently carried out.

The publications of the Institution consist of

Contributions to Knowledge,
Miscellaneous Collections,
Annual Reports,
Miscellaneous Publications,

the latter consisting for the most part of excerpts from the "Collections" and "Reports."

In the "Plan of Organization" the following objects are named for which appropriations of money or material may be made: Explorations in descriptive natural history, . . . topographical surveys, to collect materials for the formation of a Physical Atlas of the United States, . . . new determination of the weight of the earth, . . . institution of statistical inquiries with references to physical subjects, . . . accurate surveys of places celebrated in American history, . . . explorations and accurate surveys of mounds. And, as a collateral, the formation of a library was contemplated, to consist of a complete collection of the transactions and proceedings of all the learned societies of the world, and of the more important current periodical publications; also, catalogues of memoirs and of books in foreign libraries, so that the Institution would be a centre of bibliographical knowledge on any subject. The opportunity of making its library "a centre of bibliographical knowledge" on any subject was lost, however, when in 1866 it was transferred to the Library of Congress.

The earliest publication of the Institution—"Ancient Monuments of the Mississippi Valley, by E. G. Squier and E. H. Davis"—contains the results of extensive original surveys and explorations, constituting valuable additions to the stock of knowledge on a subject then little understood. The chief features of the work are scientific arrangement, simplicity, directness of statement and legitimate deductions from facts, no attempt at speculation or theory. To this work the subsequent inquiries into the early history of man in the northwest owe their chief impetus. The book is a universal guide and is even now a standard. The numerous cuts illustrating the work having been destroyed by fire in 1865, its republication, repeatedly advised and urged, has never been deemed practicable.

Closely following this first geographical offering, came "Contributions to the physical geography of the United States," by Charles Ellet, Jr., the celebrated engineer of wire bridges over the Niagara and Ohio rivers. The work presents a section from actual surveys, of the descent of the bed of the Ohio River from its source in New York to its mouth on the Mississippi. For this paper there was such urgent demand that it was reprinted and liberally distributed.

In pursuance of a design to construct a Physical Atlas of the United States, the Institution, at an early date (1848), commenced the collection of data concerning the measurements and observations of mountain ranges, canal and railway explorations, etc. But this project seems to have received very cautious encourage-

ment. Prof. George Gibbs, in 1862, strenuously urged the compilation of an Ethnological Atlas; and the same gentleman, a few years later (1865), suggested that the time had arrived when the formation of the Physical Atlas should be commenced on a scale commensurate in magnitude and variety of subject with the scientific progress of America, embracing all the departments of natural, physical and social science capable of being represented in such a form, and extended in its design to the entire continent, since the boundaries of the United States were accidental, and governed by none of the laws which control the operations of nature. He urged that preliminary skeleton maps should be prepared, but not on one scale, for the reason that while one certain part of the continent is comparatively destitute of interest over large tracts of country, others crowd into a small space a great variety, and even confusion, of details. He suggested scales of 1:1,200,000 and 1:600,000 respectively, and, besides these, a map of the entire continent on a large scale, certainly not less than 1:3,000,000, including the Arctic regions and the northern skirt of South America. The published records of the Institution contain no further allusion to the subject.

President Edward Hitchcock, under the auspices of the Institution, was engaged in 1850 in researches on erosions of the surface of the earth, especially by rivers, and also in investigations relative to terraces and ancient sea beaches.

Louis Berlandier, a native of Switzerland—geographer, historian and naturalist—arrived in Mexico in 1826 for the purpose of making researches. He died near Matamoros in 1851. The written results of his labors were deposited in the Smithsonian Institution in 1854, but subsequently withdrawn. The printed catalogue of manuscripts comprises an amount of information of the country west of the Sabine River of great importance. It includes maps of Mexican States projected by Berlandier, maps of journeys, routes, valleys, and topographies of numerous routes; topographical maps of different sections of the country; various routes and maps of ancient Texas, and locations of tribes.

In 1854 the Institution published "Remarks Contributory to the Physical Geography of the North American Continent," by Dr. Julius Frœbel. The author afterwards visited Nicaragua, Santa Fé and Chihuahua as correspondent of the *New York Tribune*, and in 1859 published "Seven Years' Travel in Central America, Northern Mexico and the Far West of the United States."

Dr. J. G. Kohl delivered an address at the Institution in 1856 on The Charts and Maps of America. He explained in a measure the causes of the loss of ancient maps; the use of former maps for completing and testing the accuracy of new ones; the value of maps as historical documents; the use of old maps in respect to boundary questions; and finally, the classes and arrangement of maps. The whole was an argument for a great collection of American maps under the auspices of the Government.

Dr. H. Berendt, a naturalized citizen of the United States, visited Yucatan in 1866, under the patronage of the Institution, in order to obtain a more accurate knowledge of the geography and natural history of that region, and to explore what was still unexplored. He first passed up the Balize River, and thence to the region about Lake Petén, making collections in natural history and prosecuting researches in geography and anthropology. The results of his investigations in part are printed in the Report for 1867.

In 1869 Gen. J. H. Simpson, U. S. A., made an interesting study of the vast geographical field embraced in the march of Vasquez de Coronado, in 1540, in search of the "Seven Cities of Cibola." Gen. Simpson had been officially engaged in the service of the United States in exploring that region. His reconnoissances of a large part of the country traversed by Coronado and his followers gave him an advantage in the discussion of the subject. His report has always been one of the most popular of the many publications of the Institution.

On the invitation of the Superintendent of the Coast Survey, Prof. Alexander Agassiz took passage in the *Hassler* while she was going to her field of duty on the coast of California, *via* the Straits of Magellan, in 1871. At the request of the Board of Regents, Prof. Agassiz gave an account of his expedition at the meeting of January 23, 1873.

In 1877 T. A. McParlin, Surgeon in the U. S. Army, communicated "Notes on New Mexico," but confined chiefly to the climatology of the country. His paper was published in the Report of that year.

In 1878 Dr. L. Kumlein, the naturalist of the Howgate Arctic Expedition, made report of explorations in Greenland. He resided several months at Cumberland Gulf, and sent extensive and valuable ethnological and natural history collections from Arctic America.

In 1890 the Institution published a paper by Col. B. Witskowski

and J. Howard Gore entitled History of Geodetic Operations in Russia.

In 1892, W. W. Rockhill made a preliminary report in connection with his expedition to the Chinese Empire, which was partly under the auspices of the Institution. This report was much enlarged and published in 1894 under the title of "Diary of a Journey through Mongolia and Tibet in 1891 and 1892."

In 1894 the Institution published Geographical Tables, prepared by Prof. R. S. Woodward, formerly of the Coast Survey, but now of Columbia College. This work is historically related to Dr. Guyot's Meteorological Tables, first published in 1852, but it is so entirely changed with respect to material, arrangement and presentation, that it is essentially a new publication. It is a representation of the latest knowledge in its field.

Prof. Baird, formerly Assistant and afterwards Secretary, presented for many years, in the Annual Reports (1852–1880), summaries of geographical explorations in all quarters of the globe, under governmental, state, society, or individual auspices. The statements were brief, but carefully prepared. The annual summaries of Prof. Baird were followed from 1882 to 1886 by publications entitled "Progress of Geography," prepared by F. M. Green (1882–3–4), J. King Goodrich (1885), and William Libbey, Jr. (1886).

The Institution has reprinted, from time to time, foreign papers of geographical interest. These comprise:

The Figure of the Earth. By M. Merino. 1863.
Geographical Latitude. By W. B. Scaife. 1889.
The Physical Structure of the Earth. By Henry Hennessy. 1890.
Stanley and the Map of Africa. By J. S. Keltie. 1890.
Objects of Antarctic Exploration. By G. S. Griffiths. 1890.
The Mediterranean, physical and historical. By Sir R. L. Playfair. 1890.
The Present Standpoint of Geography. By C. R. Markham, F.R.S. 1893.
The Renewal of Antarctic Exploration. By John Murray. 1893.
The North Polar Basin. By H. Seebohm, F.R.S. 1893.
How Maps Are Made. By W. B. Blaikie. 1893.
Variation of Latitude. By J. K. Rees. 1894.
Antarctica: a Vanished Austral Land. By H. O. Forbes. 1894.
Promotion of Further Discovery in the Arctic and Antarctic Regions. By C. R. Markham, F.R.S. 1894.
Physical Condition of the Ocean. By W. J. L. Wharton, R.N. 1894.

The Development of the Cartography of America up to the year 1570. By Dr. S. Ruge. 1894.

Race and Civilization. By W. M. F. Petrie. 1895.

Oceanography, Bionomics and Agriculture. By W. A. Herdman. 1895.

Compulsory Migration in the Pacific Ocean. By Otto Sittig. 1895.

Old Indian Settlements and Architectural Structures in North Central America. By Carl Sapper. 1895.

The Cliff Villages of the Red Rock Country, Arizona., etc. By J. W. Fewkes. 1895.

The Institution has recently issued a new catalogue of its publications, prepared by William J. Rhees, so long connected with this branch of the service.

GLACIAL LAKE AGASSIZ.—The explorations of Mr. Warren Upham while engaged in the geological and natural history survey of Minnesota (1879–85) showed that a very large lake occupied the Red River Valley in the closing stage of the glacial period.

The highest shore-line of the lake in Minnesota was mapped through its prairie portion, extending about 175 miles from Lake Traverse eastward to Herman, and thence northward to Maple Lake.

As a satisfactory investigation of the extent and history of the extinct lake would comprise both sides of the Red River Valley, the United States Geological Survey undertook the more extended examination of the area, and assigned Mr. Upham to the duty. When the shore-lines had been mapped through North Dakota to the Canadian boundary line, it was arranged with the authorities of the latter country that Mr. Upham's work should be continued through Southwestern Manitoba. Altogether the explorations occupied six years, and the results are embodied in a volume recently published by the United States Geological Survey,* entitled "The Glacial Lake Agassiz."

The situation of this great lake was in the geographic centre of the continent,—about one-fifth lying within the United States. The area covered was approximately from 45° 30′ to 55° north latitude, and from 92° 30′ on the boundary to 106° west longitude. It was several times larger than Lake Superior; in fact, it exceeded the aggregate area of the five great lakes contributory to the St. Lawrence. Through the earlier part of its duration it outflowed southward to the Mississippi River. Later it outflowed by lower avenues

* Monograph, Vol. XXV.

northeastward. Finally it was reduced to Lakes Winnipeg, Manitoba and Winnipegosis, which are its lineal descendants. It covered at one time portions of Manitoba, Minnesota and North Dakota.

In explanation of the existence of this lake and of its name, Mr. Upham says: "When the Glacial period in North America was ending, as soon as the border of the ice had receded beyond the watershed dividing the basins of the Minnesota and Red rivers, it is evident that a lake, fed by the glacial melting, stood at the foot of the ice-fields, and extended northward as they withdrew along the Red River Valley to Lake Winnipeg, filling this valley to the height of the lowest point over which an outlet could be found. Until the ice barrier was so far melted upon the area between Lake Winnipeg and Hudson Bay that this glacial lake began to be discharged northeastward, its outlet was along the present course of the Minnesota River. Because of its relation to the retreating continental ice-sheet, the lake has been named in memory of Prof. Louis Agassiz, the first prominent advocate of the theory that the drift was produced by land ice."

EXPEDITION TO THE SOUTHERN HEMISPHERE.—We have a reminder of the U. S. Naval Expedition to the Southern Hemisphere in 1849–52, under Capt. J. M. Gilliss, by the recent appearance of "A Catalogue of 16,748 southern stars deduced by the U. S. Naval Observatory from the zone observations made by the U. S. Naval Expedition during 1849–52."

The Narrative of this expedition, excepting Vols. 4 and 5, was published in 1855–56. The material comprised in the "Catalogue" now issued was originally intended to form Vols. 4 and 5, but owing to the insufficient staff of workers and the death of Capt. Gilliss the work was never completed. At the time of his death much had been done, and before the office of the Expedition was closed in 1866, the manuscript of the Observations to be contained in Vol. 4 was ready for the printer, and Vol. 5 was so far advanced that it was supposed it could be finished in about a year. From 1866 to 1894 the papers were in the custody of the Naval Observatory, receiving such attention in the way of computations and reductions as the time at the command of the force would allow. The reductions were finally completed by Professors E. Frisby, U. S. N., and S. J. Brown, U. S. N., and have just been issued as "Appendix i, Washington Observations for 1890." This volume of 486 pages 4to, may therefore be considered the substitute for the 4th and 5th volumes of Gilliss's U. S. Naval Astronomical Expedition.

OCEANIC ICHTHYOLOGY.—The great work by the late Dr. G. Brown Goode and Tarleton H. Bean on the deep-sea and pelagic fishes of the world has been published under the supervision of the Smithsonian Institution. Oceanic ichthyology is concerned with the study of fishes which dwell in the open ocean far from the shore.

The authors do not claim that they have brought forward any conclusions which are new to science, though a great number of new facts are recorded. The information which they have obtained they have endeavored to bring into proper relationship with the mass of similar knowledge already recorded. The work as it now appears was first ready for the press in 1885, then revised and re-written in 1888, then again in 1891, and again in 1894, as it was going through the press. The authors say: "In its present form it stands as a compendium and summary of existing knowledge in regard to Oceanic Ichthyology. No one knows when there will be opportunity for its further study. There are no expeditions and there seems to be no prospect for new ones. Even the *Albatross*, built by the United States expressly for this service, is diverted to police duty about the Seal Islands."

ALASKA BOUNDARY.—The Superintendent of the Coast Survey says that in determining the 141st meridian of longitude the notes of the British surveyor have been compared with those of the American surveyors and have been found to vary so little that no trouble will be found in striking a compromise between the two lines. The maps of the whole survey, that is to say, of the 141st meridian, and of the line of ten marine leagues from the coast, are now in possession of the two Governments, and it is understood that negotiations are about completed looking to the selection of a joint commission to strike the line between the two countries. The Superintendent expresses the belief that the Alaskan gold fields are located on the American side of the 141st meridian.

NICARAGUA.—Mr. Henry E. Low, the Vice-Consul at Managua, has sent to the Department of State a map of Nicaragua, which gives a rough sketch of the existing railroads in the country and the lines which are projected. The thickest parts of Nicaragua lie on the Pacific, and civilization does not reach, on an average, much further inland than about 100 miles from the coast. Beyond this 100-mile belt, the country is not even properly explored.

NOTES.—The U. S. Hydrographic Office has recently issued a new chart—34 x 41 inches—of the Pacific Ocean, compiled from

the latest information; also, of the Atlantic Coast from the Strait of Belle Isle to New York; and of portions of the west coast of North America, that is to say, of the west coast of Lower California, and the west coast of Vancouver Island. The office has also published Sunrise and Sunset Tables, showing the local mean time of the sun's visible rising and setting for each degree of latitude between 60° N. and 60° S., and for each degree of the sun's declination.

Mr. W. J. Hoffman, of the National Museum, has in press an illustrated work on the Graphic Arts of the Eskimos, in which he discusses their geographical distribution, population, early explorations, pre-historic art, art in general, ornamentation and materials employed, pastimes, gesture signs, etc.

The United States Geological Survey is placing iron monuments in Wyoming at each township corner, with bench marks. The posts are iron tubing, $3\frac{1}{2}$ inches in diameter and 4 ft. long. On the top is fastened a brass plate on which is stamped "U. S. Geological Survey, B. M." The elevation, township and range numbers will be stamped on the plate by dies carried by the engineers. In the future, all Government surveys will be marked in this manner in the West. The system will be of immense value to settlers, ranchmen and civil engineers. H.